July 14, 1936. A. G. FITE 2,047,864

WATER HEATING SYSTEM

Filed Sept. 5, 1934

Fig. 1.

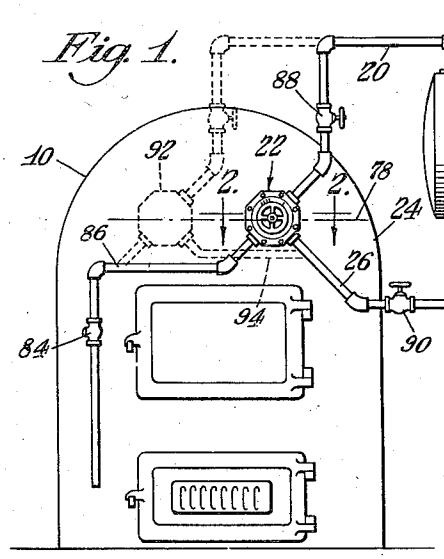


Fig. 2.

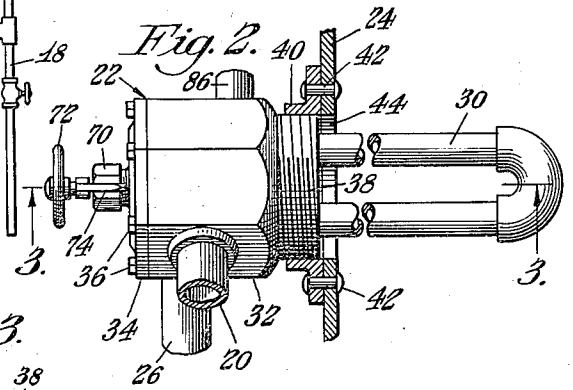


Fig. 3.

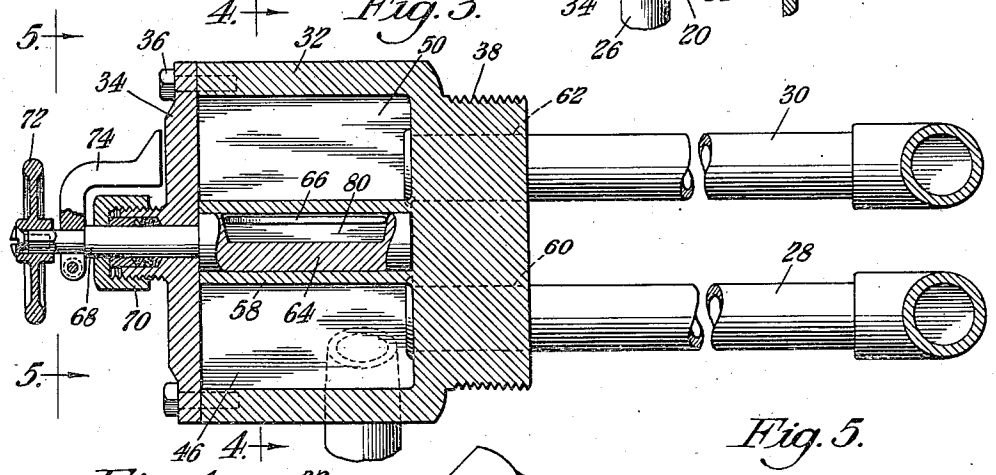


Fig. 4.

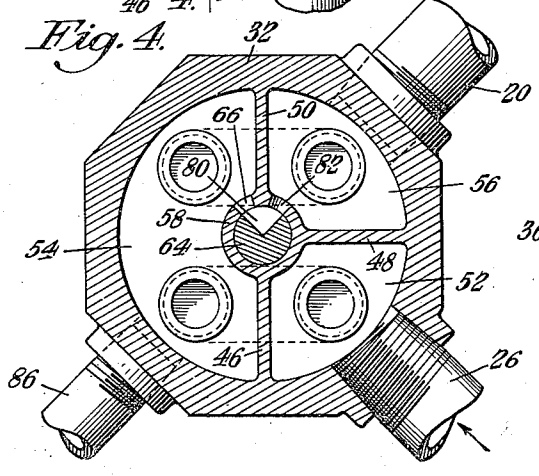
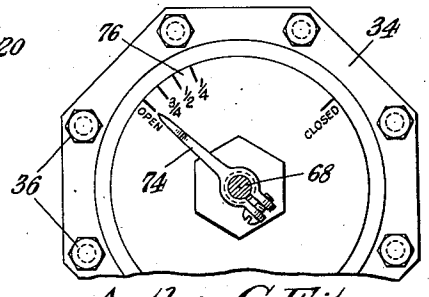


Fig. 5.



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HIS ATTORNEYS

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WATER HEATING SYSTEM

Arthur G. Fite, Chicago, Ill.

Application September 5, 1934, Serial No. 742,850

9 Claims. (Cl. 257—248)

My invention relates to heating systems, and has among its objects and advantages the provision of an improved coil for heating water. The invention is applicable to boilers of conventional design and may be associated with such boilers after installation. In addition, I provide a novel valve mechanism for regulating the flow of water through the coils so that water may be heated in accordance with variable hot water demands. A further feature resides in the provision of an improved blow-off structure permitting effective cleaning of the coil and valve structure.

In the accompanying drawing:

Fig. 1 is an elevation of a steam boiler of conventional design embodying the invention;

Fig. 2 is a sectional view along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view along the line 3—3 of Fig. 2;

Fig. 4 is a sectional view along the line 4—4 of Fig. 3; and

Fig. 5 is a fragmentary view of the control end of the valve drum.

In the embodiment selected to illustrate my invention, I make use of a conventional boiler 10 associated with a usual hot water storage tank 12. This tank is provided with the usual cold water feed pipe 14, hot water supply pipe 16, and blow-off pipe 18. The hot water feed pipe 20 for the storage tank 12 is connected with a coil valve 22 mounted upon the end 24 of the boiler. Cold water passing through the storage tank 12 is delivered to the coil valve 22 through the medium of a pipe 26, and normally circulates through coils 28 and 30 positioned within the boiler 10 before it is delivered to the hot water storage tank 12.

My coil valve 22 comprises a drum 32 having an open end closed by a cover 34 through the medium of bolts 36. One end of the drum is provided with a threaded neck 38 screwed into a threaded flange 40 riveted to the boiler shell 24 by rivets 42. Of course, the flange 40 may be welded to the shell instead of riveted thereto as shown. Either type of fastening permits the coil valve 22 to be easily mounted upon the boiler by merely cutting an opening 44 in the boiler shell and securing the flange 40 in place. In Fig. 1, I illustrate the coil valve 22 as being positioned to one side of the vertical center line of the boiler to permit another unit to be mounted upon the boiler.

Three partitions 46, 48, and 50 separate the drum 32 into three compartments 52, 54, and 56. The partitions are cast integrally with the drum 32 and a valve cylinder 58. Both the coils 28 and 30 are U-shaped. In Figs. 3 and 4, I illustrate the ends of the coil 28 as being anchored within openings 60 in the neck 38, which ends communicate with the compartments 52 and 54. Similarly, the ends of the coil 30 are anchored within openings 62 in the neck 38 and communicate with the compartments 54 and 56.

Water from the pipe 26 enters the compartment 52, passes through the coil 28 and into the compartment 54. Normally, the valve plug 64 is positioned for closing the opening 66 in the valve cylinder 58 so that the water entering the compartment 54 flows through the coil 30 into the compartment 56 and to the hot water storage tank 12. Referring to Fig. 3, the valve plug 64 is provided with a shaft 68 passing through a packing gland 70 on the cover 34 and provided with a grip member 72.

I mount a pointer 74 upon the shaft 68 to indicate various adjusted positions of the valve plug 64, as indicated by the indicia 76, see Fig. 5. In Fig. 1, I indicate the level of the water in the boiler at 78, so that the coil 30 lies in a plane above the water level and is influenced by the temperature of the steam above the water. In this way, I make use of the higher temperature of the steam during that part of the year when a small fire is maintained in the boiler. Less fire is required in the boiler for heating water. However, during cold weather a larger fire is maintained in the boiler. Under such conditions, the level 78 is raised to submerge the coil 30 and to prevent overheating of the water passing through the coils, in addition to providing protection for the tubing and the reduction of scale formation therein.

During the high temperature period of use, it may be that the water supply would become overheated. To prevent such an occurrence, it may be desirable to shunt some of the water entering the coil drum 22 around one of the tubes. This may be accomplished by adjusting the valve plug 64 to the position of Fig. 4. Thus, much of the water entering the compartment 54 from the coil 28 flows through the opening 66, the opening 80 in the valve plug, and the opening 82 in the valve cylinder. In this way, the water entering the compartment 56 will pass directly to the hot water storage tank 12.

My coil valve 22 is constructed to permit effective cleaning of the coils 28 and 30 at desired intervals. To this end, I provide a blow-off valve 84 in the pipe 86 connected with the drum 32

and communicating with the compartment 54. In Fig. 1, I illustrate the pipes 20 and 26 as being provided with valves 88 and 90, respectively. With the plug 64 adjusted to close the opening 66, I clean the valve 28 by opening the blow-off valve 84 and keeping the valve 90 open to permit the water under pressure directed to the pipe 26 to flow into the chamber 52 through the coil 28 into the compartment 54, and out of the system through the pipe 86. Similarly, the tube of the coil 30 may be cleaned by opening the blow-off valve 84 and keeping the valve 88 open to permit water under pressure to flow into the compartment 56 through the coil 30 into the compartment 54 and out of the system through the pipe 86.

To accommodate additional coil valves 22, as indicated at 92, I offset the pipe 86 with respect to the pipe 26. In other words, the pipe 26 is connected with the valve drum 32 near its threaded end, see Fig. 2, so that the pipe 94 for the unit 92 may be connected with the pipe 26 without interference from the pipe 86.

Without further elaboration, the foregoing will so fully explain my invention that others may by applying current knowledge readily adapt the same for use under various conditions of service.

I claim:

1. A water heater comprising a valve drum, a pair of coils communicating with said valve drum, and a valve arranged within the valve drum for diminishing the flow of water through one of said coils.

2. A water heater comprising a valve drum having three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, and a valve within the compartments for controlling the circulation of water through said coils.

3. A water heater comprising a valve drum, said valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, and valve means for establishing communication between the said one of two compartments and the third compartment.

4. A water heater comprising a valve drum, said valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, valve means for establishing communication between the said one of two compartments and the third compartment, and a blow-off valve associated with said valve drum and communicating with said one of two compartments.

5. A water heater comprising a valve drum, said valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, valve means for establishing communication between the said one of two compartments and the third compartment, a blow-off valve associated with said valve drum and communicating with said one of two compartments, and valve means for controlling the flow of water into one of said two compartments and the third compartment.

6. A water heater comprising a valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, a cylindrical valve housing positioned within said valve drum and having openings arranged to establish communicaton between said one of said two compartments and the third compartment, and a valve arranged within said cylindrical valve housing for closing said openings.

7. A water heater comprising a valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, a cylindrical valve housing positioned within said valve drum and having openings arranged to establish communication between said one of two compartments and the third compartment, a valve arranged within said cylindrical valve housing for closing said openings, said valve housing being provided with a water inlet pipe communicating with one of said two compartments, and a water outlet pipe communicating with said third compartment.

8. A water heater comprising a valve drum comprising three compartments, a pair of coils connected with said valve drum, one of said coils communicating with two of said compartments, the other coil communicating with one of said two compartments and the third compartment, a cylindrical valve housing positioned within said valve drum and having openings arranged to establish communication between said one of two compartments and the third compartment, a valve arranged within said cylindrical valve housing for closing said openings, said valve housing being provided with a water inlet pipe communicating with one of said two compartments, a water outlet pipe communicating with said third compartment, and a blow-off valve structure connected with said valve drum and communicating with said first mentioned one of two compartments.

9. In a water heater, a drum, a plurality of coils connected with the drum, means for delivering water to and from the drum, and means associated with the drum for diminishing the flow of water through one of said coils.

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